Broadcom NetXtreme 10 GbE SFP+ Network Adapter Family for System x

IBM Redbooks Product Guide

IBM® offers the Broadcom 10 GbE SFP+ network adapter family that is based on the Broadcom BCM57811S and BCM57810S controllers for IBM System x® servers. These adapters use Broadcom's controller technology, which provides outstanding performance, efficiency, and scalability for the enterprise data center. The adapters connect to SFP+ Multimode Fiber SR optical modules and direct-attach copper (DAC) cables.

The Broadcom Dual Port 10 GbE SPF+ Embedded Adapter for IBM System x is shown in the following figure.

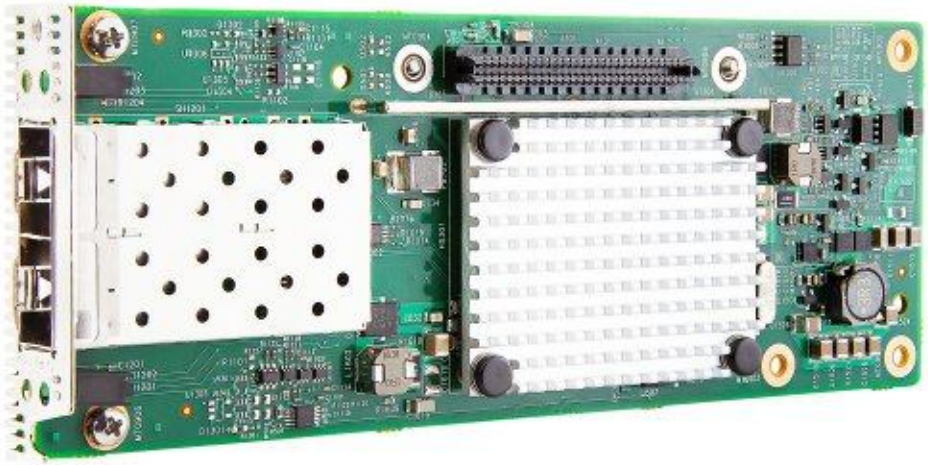

Figure 1. Broadcom Dual Port 10 GbE SPF+ Embedded Adapter for IBM System x

Did you know?

The single and dual-port Embedded Adapters (also known as mezzanine adapters) are designed specifically to fit in to a dedicated slot in servers such as the IBM System x3650 M4. This card design allows you to use the server's standard PCIe slots for other technologies.

Part number information

The following table shows the ordering part numbers and feature codes for this adapter.

Table 1. Ordering part numbers and feature codes

Part number	Feature code	Description
94Y5180	A4Z6	Broadcom Dual Port 10GbE SFP+ Adapter for IBM System x
00D9700	A4C3	Broadcom Single Port 10GbE SFP+ Embedded Adapter for IBM System x
44T1360	A4YQ	Broadcom Dual Port 10GbE SFP+ Embedded Adapter for IBM System x
00D2028	A40T	Broadcom NetXtreme II ML2 Dual Port 10GbE SFP+ for IBM System x

The part numbers for the adapters include the following items:

- One Broadcom adapter
- Support CD
- Safety flyer
- The PCIe adapters (94Y5180 and 00D2028) have a 3U bracket that is attached and include a 2U bracket in the box

The Broadcom Dual Port 10GbE SFP+ Adapter for IBM System x is shown in the following figure.

Figure 2. Broadcom Dual Port 10GbE SFP+ Adapter for IBM System x

Transceivers are not included with the adapters. The adapters support the SFP+ SR transceivers and direct-attach copper (DAC) cables that are listed in the following table.

Table 2. Supported transceivers and DAC cables

Description	Option part number	Feature code
Optical Transceivers		
QLogic 10Gb SFP+ SR Optical Transceiver	49Y4218	0064
Brocade 10Gb SFP+ SR Optical Transceiver	49Y4216	0069
IBM SFP+ SR Transceiver	46C3447	5053
Active Direct-attach copper (DAC) cables		
1m IBM Active DAC SFP+ Cable	95Y0323	A25A
3m IBM Active DAC SFP+ Cable	95Y0326	A25B
5m IBM Active DAC SFP+ Cable	95Y0329	A25C
Passive Direct-attach copper (DAC) cables		
0.5m IBM Passive DAC SFP+ Cable	00D6288	A3RG
1m IBM Passive DAC SFP+ Cable	90Y9427	A1PH
3m IBM Passive DAC SFP+ Cable	90Y9430	A1PJ
5m IBM Passive DAC SFP+ Cable	90Y9433	A1PK
7m IBM Passive DAC SFP+ Cable	00D6151	A3RH

The following figure shows the Broadcom NetXtreme II ML2 Dual Port 10GbE SFP+ adapter.

Figure 3. Broadcom NetXtreme II ML2 Dual Port 10GbE SFP+

Features and specifications

Virtualization, cloud computing, high performance computing (HPC), and clustering initiatives are increasing workload demands. The Broadcom network adapter family is the solution of choice for workload-intensive computing environments, providing a reliable, high-performance 10 GbE connectivity solution.

The adapters have the following features and specifications:

- Dual-port or single-port 10 Gb Ethernet connectivity
- ASIC:
  - Single port adapter: Broadcom BCM57811S controller
  - Dual port adapters: Broadcom BCM57810S controller
- Choice of form factors:
  - Mezzanine (Embedded) form factor adapters are supported in selected IBM System x servers, which reserve the server's standard PCIe slots for other technologies.
  - ML2 (Mezzanine LOM Generation 2) adapters are supported in selected IBM System x servers, where the adapter is installed in a dedicated slot and supports shared access to the IMM2 management processor
  - The PCIe adapter is supported in a low-profile PCIe adapter slot in a wide variety of System x servers
- SFP+ port supporting fiber optic and direct-attach copper (DAC) cables
- PCI Express 2.0 x8 host interface (5 GTps)
- Full line-rate performance
- Ethernet frame: 1500 byte or 9600 byte (jumbo frame)
- VLAN support with VLAN tagging
- Performance features:
  - TCP/IP Offload Engine (TOE)
  - TCP segmentation/large send offload
  - Receive-side scaling (RSS) for IPv4 and IPv6
  - TCP/IP checksum offload for IPv4 and IPv6
  - UDP/IP checksum offload for IPv4 and IPv6
  - Message signal interrupt (MSI, MSI-X) support
  - PXE 2.x support
- Wake on LAN (ML2 and Mezzanine cards only)
- Preboot eXecution Environment (PXE) support
- IEEE 1588 Precision Time Protocol (PTP)-Ready
- Network teaming, failover, and load balancing
  - Smart Load Balancing (SLB)
  - Link Aggregation Control Protocol (LACP) and generic trunking
- Management using Broadcom Advanced Control Suite management application
- Support for Network Controller Sideband Interface (NC-SI) for communication with the server's onboard IMM2 management processor. This support enables the sharing the network interface with the IMM2 and the operating system, thereby eliminating the need for a separate management network (ML2 and mezz adapters only)
- Power consumption:

- Single port mezz card: 4.74 W typical
- Dual port mezz card: 7.14 W typical
- Dual port ML2 card: 14.4 W typical
- Dual port PCIe card: 7.08 W typical

- Compliance
  - IEEE 802.3ae (10 Gb Ethernet)
  - IEEE 802.1q (VLAN)
  - IEEE 802.1p (Priority Encoding)
  - IEEE 802.3x (Flow Control)
  - IEEE 802.1au (Congestion Notification)
  - IPv4 (RFQ 791)
  - IPv6 (RFC 2460)

The Broadcom Single Port 10 GbE SPF+ Embedded Adapter for IBM System x is shown in the following figure. The adapter is ideal for solutions where price sensitivity is paramount and where port-level redundancy is not required.

Figure 3. Broadcom Single Port 10 GbE SPF+ Embedded Adapter for IBM System x

Supported servers

The adapter is supported in the System x servers that are listed in the following table. Only one Broadcom Single Port 10 GbE SPF+ Embedded Adapter can be installed in each server.

Table 3. System x and iDataPlex compatibility (Part 1)

Part number	Description	x3250 M5 (5458)	x3500 M4 (7383, E5-2600 v2)	x3550 M4 (7914, E5-2600 v2)	x3650 M4 (7915, E5-2600 v2)	x3650 M4 HD (5460)	x3850 X6/x3950 X6 (3837)	dx360 M4 (7912, E5-2600 v2)	nx360 M4 (5455)
00D9700	Broadcom Single Port 10GbE SFP+ Embedded Adapter	N	N	Y	Y	N	N	N	Y
44T1360	Broadcom Dual Port 10GbE SFP+ Embedded Adapter	N	N	Y	Y	Y	N	Y	N
94Y5180	Broadcom Dual Port 10GbE SFP+ Adapter	N	Y	Y	Y	Y	N	Y	Y
00D2028	Broadcom NetXtreme II ML2 Dual Port 10GbE SFP+	N	N	N	N	N	Y	N	N

Table 3. System x and iDataPlex compatibility (Part 2)

Part number	Description	x3100 M4 (2582)	x3250 M4 (2583)	x3300 M4 (7382)	x3500 M4 (7383, E5-2600)	x3530 M4 (7160)	x3550 M4 (7914, E5-2600)	x3630 M4 (7158)	x3650 M4 (7915, E5-2600)	x3690 X5 (7147)	x3750 M4 (8722)	x3850 X5 (7143)	dx360 M4 (7912, E5-2600)
00D9700	Broadcom Single Port 10GbE SFP+ Embedded Adapter	N	N	N	N	N	Y	N	Y	N	N	N	N
44T1360	Broadcom Dual Port 10GbE SFP+ Embedded Adapter	N	N	N	N	N	Y	N	Y	N	N	N	Y
94Y5180	Broadcom Dual Port 10GbE SFP+ Adapter	N	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y
00D2028	Broadcom NetXtreme II ML2 Dual Port 10GbE SFP+	N	N	N	N	N	N	N	N	N	N	N	N

For the latest information about the System x servers that support this adapter, see the IBM ServerProven® website at http://ibm.com/servers/eserver/serverproven/compat/us/

The following figure shows where the Broadcom Single Port 10 GbE SPF+ Embedded Adapter is installed in the x3650 M4 server. Its location and connection does not consume any of the available standard PCIe slots.

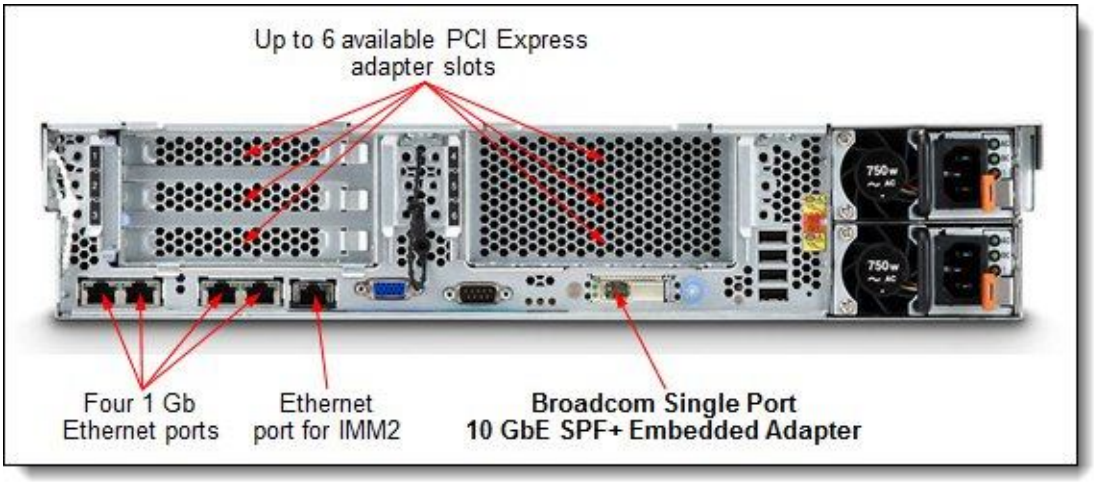
Up to 6 available PCI Express adapter slots
Four 1 Gb Ethernet ports
Ethernet port for IMM2
Broadcom Single Port 10 GbE SPF+ Embedded Adapter

Figure 4. Rear of the IBM System x3650 M4

Operating system support

The adapters support the following operating systems:

- Microsoft Windows Server 2008 R2 SP2
- Microsoft Windows Server 2008, Datacenter x64 Edition
- Microsoft Windows Server 2008, Datacenter x86 Edition
- Microsoft Windows Server 2008, Enterprise x64 Edition
- Microsoft Windows Server 2008, Enterprise x86 Edition
- Microsoft Windows Server 2008, Standard x64 Edition
- Microsoft Windows Server 2008, Standard x86 Edition
- Microsoft Windows Server 2008, Web x64 Edition
- Microsoft Windows Server 2008, Web x86 Edition
- Microsoft Windows Server 2012
- Microsoft Windows Server 2012 R2
- Red Hat Enterprise Linux 5 Server Edition U9
- Red Hat Enterprise Linux 5 Server with Xen x64 Edition U9
- Red Hat Enterprise Linux 5 Server x64 Edition U9
- Red Hat Enterprise Linux 6 Server Edition U4
- Red Hat Enterprise Linux 6 Server x64 Edition U4
- SUSE Linux Enterprise Server 11 for AMD64/EM64T SP3
- SUSE Linux Enterprise Server 11 for x86 SP3
- SUSE Linux Enterprise Server 11 with Xen for AMD64/EM64T SP3
- VMware vSphere 5.0 (ESXi) U2
- VMware vSphere 5.1 (ESXi) U1
- VMware vSphere 5.5 (ESXi)

For the latest information about the specific versions and service packs supported, see the IBM ServerProven website at http://ibm.com/servers/eserver/serverproven/compat/us/.

Popular configurations

This section illustrates how the Broadcom Single Port 10 GbE SPF+ Embedded Adapter can be used in a 10 Gb Ethernet configuration. The following figure shows the adapter that is installed in the x3650 M4 and connected to an IBM RackSwitch™ G8124E top-of-rack switch.

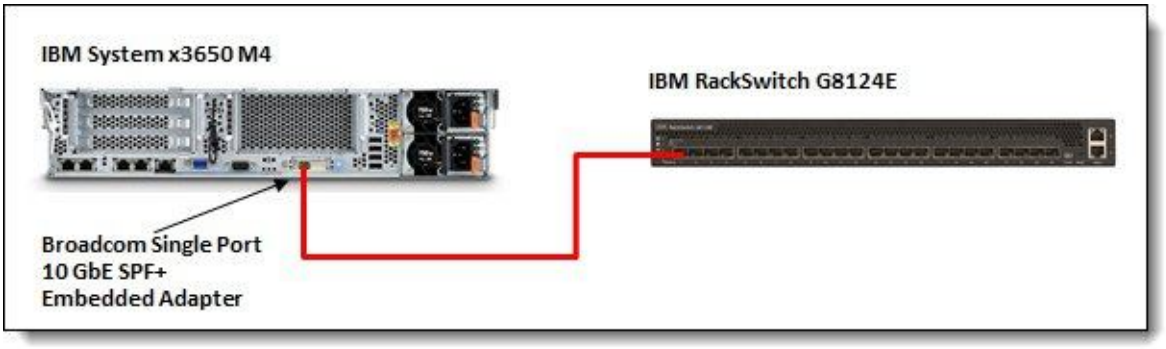

Figure 5. 10 Gb Ethernet solution

The parts that are used are listed in the following table. We provide two cabling options: a direct-attach copper (DAC) cable option and a fiber optic cable option.

Table 4. Components that are used when connecting the Broadcom Single Port 10 GbE SPF+ Embedded Adapter to an Ethernet switch

Part number/ machine type	Description	Quantity
7915	IBM System x3650 M4 or other supported server	1
00D9700	Broadcom Single Port 10 GbE SPF+ Embedded Adapter	1
7309BF7	IBM RackSwitch G8124E	1
Direct-attach copper (DAC) cable connectivity		
95Y0323	1 m IBM Active DAC SFP+ Cable	1
Fiber optic cable connectivity		
46C3447	IBM SFP+ SR Transceiver	2
88Y6851	1 m LC-LC Fiber Cable (networking) - Optical	1

Warranty

The adapters carry a 1-year, customer-replaceable unit (CRU) limited warranty. When they are installed in a supported IBM server, these adapters assume your system's base warranty and any IBM ServicePac® upgrade.

Physical specifications

The adapters have the following physical specifications:

Embedded adapter dimensions (approximate):

- Width: 60 mm (2.4 in.)
- Length: 160 mm (6.3 in.)
- Height: 17 mm (0.7 in.)

PCIe adapter dimensions (approximate):

- Height: 69 mm (2.7 in.)
- Length: 168 mm (6.6 in.)
- Width: 17 mm (0.7 in.)

ML2 adapter dimensions (approximate):

- Height: 69 mm (2.7 in.)
- Length: 168 mm (6.6 in.)
- Width: 17 mm (0.7 in.)

All adapters have the following shipping dimensions and weight (approximate):

- Height: 189 mm (7.51 in.)
- Width: 90 mm (3.54 in.)
- Depth: 38 mm (1.50 in.)
- Weight: 450 g (0.99 lb)

Operating environment

The adapter is supported in this environment:

- Temperature:
  - Operating: 0° to 55°C (32° to 131 °F) at 0 - 914 m (0 - 3000 ft)
  - Storage: -20° to 65°C (-4° to 149°F) at 0 - 914 m (0 - 3000 ft)
- Relative humidity: 5% - 95% (non-condensing)

Agency approvals

The adapters have the following agency approvals:

- EN55022
- EN55024
- EN60950 / CE
- EN 61000-3-2
- EN 61000-3-3
- ICES-003, Issue-004
- IEC 950 CB Scheme
- FCC 47 CFR Part 15 Class A
- UL 1950
- CSA C22.2 950-95
- VCCI

- AS/NZSCISPR 22 / C-tick
- RRL for KC
- BSMI
- UL 94-/V

Related publications

For more information, see the following documents:

- Announcement letter - Broadcom NetXtreme II ML2 Dual Port 10GbE SFP+
  http://ibm.com/common/ssi/cgi-bin/ssialias?infotype=dd&subtype=ca&&htmlfid=897/ENUS114-031
- Announcement letter - Broadcom Single Port 10GbE SFP+ Embedded Adapter
  http://ibm.com/common/ssi/cgi-bin/ssialias?infotype=dd&subtype=ca&&htmlfid=897/ENUS113-122
- Announcement letter - Broadcom dual-port adapters
  http://ibm.com/common/ssi/cgi-bin/ssialias?infotype=dd&subtype=ca&&htmlfid=897/ENUS113-213
- Product web page
  http://ibm.com/systems/x/options/networking/adapters.html
- *IBM System x Configuration and Options Guide*
  http://ibm.com/systems/xbc/cog/
- *IBM System x Networking Interoperability Guide*
  http://ibm.com/common/ssi/cgi-bin/ssialias?htmlfid=XSO03137USEN

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